The Computer Enhancement of a Medical Office

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For several years small businesses have struggled to take advantage of the promised capabilities of the microcomputer. Limited by processor power and hindered by unyielding software these promises have gone largely unfulfilled. However, recent advances in processor speed and a new generation of user friendly software have made the microcomputer a true ally for improving the operating efficiency of an office. Now, economical computing platforms can be linked together and run with off-the-shelf software to enhance the capabilities of any medical business.

Every year physicians in Hawaii feel themselves squeezed tighter by increasing regulation, increasing expenses and overhead, and decreasing reimbursement. Time spent keeping and verifying records and filing for insurance often exceeds the time spent seeing the patient. An easing of the regulatory paperwork burden does not seem likely in the near future. Fortunately, affordable computer hardware and software have improved enough to help alleviate the situation, greatly reducing the time and effort involved in taking care of the annoying paperwork necessary to run a practice.

Office management software packages have been available for many years but have not gained universal acceptance due to several limitations:

- they are hard to use and learn
- they are very difficult to customize
- it is difficult for more than one person at a time to use them
- it has been difficult to integrate these programs with other office software
- they have been rather expensive, often costing tens of thousands of dollars.

Many physicians have been frustrated by these limitations and have therefore custom-designed their own systems. However, the substantial time investment in learning about computers and the subsequent programming required to support these efforts will have offset any savings. It has not been something for a novice user to contemplate. Nevertheless, recent advances in hardware and software have greatly simplified this process. It is now practical for even a small, computer illiterate office to take advantage of the efficiencies that can be provided by computers.

How to Save Time on Medical Records and Correspondence

Word processing programs allow rapid duplication or modification of typed documents. Thus, documents that must be revised frequently (such as OSHA manuals precautionary guidelines) or changed slightly between differentiated copies (such as referral letters to multiple physicians) can be printed without having them manually typed each time. Additional features such as spell-checking, page formatting and the ability to use different type styles within one page make these programs even more practical. Even grammar support is available for many word processors. All of the newer, top-performing programs, such as Microsoft Word and WordPerfect, support WYSIWYG (What You See Is What You Get) and display text in a more natural form using high-contrast black letters on white background. Both features make these programs much less tedious and environmentally more comfortable to work with than their predecessors.

Advanced features common among the more current word processors include object insertion and manipulation, and object linking and embedding. These features enable diagrams, charts, tables, and even photographs to be inserted and modified within the document with ease. Object linking and embedding also makes a seamless connection between the word processor and the object's parent application. This allows modifications to be performed without having to constantly switch back and forth between word processor and parent application. Thus, a Word document containing a graphics image originally created with a drawing program such as CorelDraw can be modified by CorelDraw from within Word. Though this may seem overly complicated, the actual operation is quite user-friendly and easy to perform.

How to Save Time on Filing Insurance Claims

Data base programs can streamline many of the time-consuming steps involved in filing insurance claims. Handwritten or typed claims must be processed one at a time with mistakes corrected on all copies. Any subsequent changes or re-submissions usually involve a laborious sequence of steps. The initial search for a particular claim first requires consulting the filing cabinet. Subsequent recalculations are performed on accounts receivable and paid, which in turn requires re-entering the data into the other office accounting systems. If the data from claims filed is entered into a computer data base, many advantages may be realized. The data base can be used to generate various formatted patient lists reflecting any form of demographic information (a mailing list, for example). This information can be sorted or classified according to diagnosis, procedure, or time of treatment. It can be used to edit insurance claim forms prior to printing. Finally, accounts receivable and paid can be generated quickly and easily.

The use of data-base management programs in the past has been a daunting task and users were more likely to swear at the program than to swear by it. Customizing the data base was essentially the same as programming. Newer data base programs have made the task much easier for everyone, including the computer novice. Data base management programs such as Microsoft's Access or Borland's Paradox offer many of the more advanced forms of support for data handling and information processing. In addition to supporting data entry and retrieval, each program contains powerful tools for customizing forms, creating charts, and designing querying operations. These capabilities also can be combined to build small command programs known as macros. (Some of these advanced capabilities are not recommended for the uninitiated.)

The Computer's General Support Program

A type of program that is often allied to data base managers is

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the spreadsheet. As the name implies, spreadsheets are electronic versions of paper worksheets. The difference is that they support the user with a full library of powerful data operations and mathematical functions. They also are versatile in receiving input data, modifying the data, and transferring the resulting output data, making them extremely useful with other applications. This makes the spreadsheet a powerful tool for designing forms, creating data bases, and performing calculations on large amounts of data.

Common uses for spreadsheets are inventory projections, project budgeting, and capital investment analysis. They also are suitable for handling statistics and generating demographic information from large amounts of raw data. In its simplest form the spreadsheet can serve as a very powerful desktop calculator.

How to Save Time When Working on More Than One Computer

Sharing information between 2 computers usually involves making a copy of the information on a diskette or diskettes, carrying it to a different computer, and copying it from the diskettes onto the new computer. Computer "nerds" are thus seen frequently hauling little piles of diskettes around with them.

Since the information is electronic, it can be sent over a communications line. If 2 computers are connected by a line they can "talk" to one another; this can be accomplished by connecting both machines with telephone lines. However, the quality of the signal that is transmitted over these lines is modest at best and the subsequent transmission therefore must be very slow.

The use of cable similar to TV cable (coaxial cable) allows greatly improved quality and much higher transmission rates, resulting in a quicker, cleaner communications link.

Linking computers together in this manner is called networking and essentially eliminates the need to tote diskettes around within an office environment. In addition, it is possible to operate a program that resides on one computer, from a different computer that does not actually have that program. To the user the program will appear to "virtually" exist and run on his or her machine, though it physically resides elsewhere. It also is possible for a user to initiate and control a program on another computer from his or her computer without disturbing the user on the other computer. This level of networking is a form of robust connectivity and greatly facilitates the ability of work groups to perform both as a team and independently within an office environment.

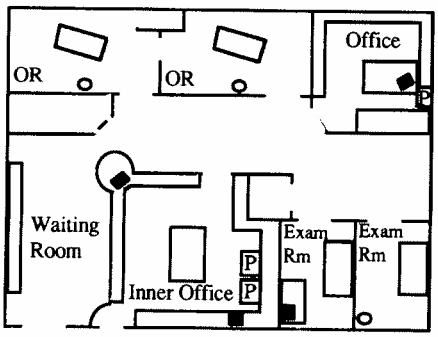

Figure 1: Typical small office network. Four computer stations (black boxes) and 3 printers (Ps), are linked by coaxial cables in the ceiling. Three future stations are indicated by small circles.

The formal networking of computers has been a nightmare in the past with the learning of a new networking language and huge headaches with communication "protocols". However, networking is coming of age, with each subsequent generation becoming more user-friendly. A friendly form of networking software is already included in the Macintosh System 7 operating system. Complete networking capability is an integral part of the Windows for Workgroups software package, with no special knowledge required to use it. Other network software is becoming easier to use as well, but generally requires an individual with some knowledge who becomes the "network administrator". The simplest form of networking supports file sharing. This enables a physician to quickly scan patient registration information located in a file on the receptionist's computer. More sophisticated support allows multiple users to access and work on the same file at the same time through 2 or more computers (receptionist and billing clerk, for example). The larger the office, the more helpful these features become.

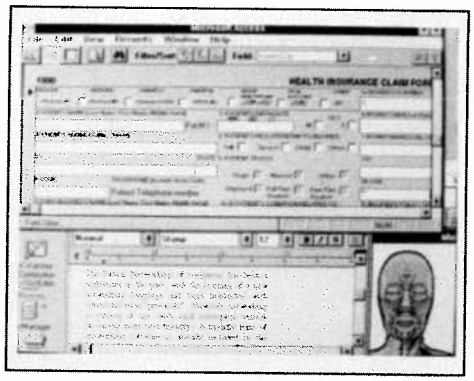

Figure 2: Multi-tasking with Windows 3.1. The active window shows the Access data base manager running an insurance data entry form. Patient information entered through this form will be stored in the general patient data base. Below the Access window is an MS Word window and its document. In the lower right-hand corner of the screen an anatomy program is displaying a muscle diagram for the face. Background utility programs are visible in iconized (reduced) form in the lower left part of the screen.

The networking of a small office can normally be performed in one day. Typically a morning is spent running the necessary cables to the various node sites and installing the required communications cards in each computer. The software installation and system configuration then can be performed in the afternoon. (An example of a small office network is illustrated in Figure 1.) Once the system is connected, user accounts are assigned, security software initiated, and sharable resources, such printers and certain data base files are set up. These features allow a user to "log on" to one machine, generate documents through a second, and print the results on a printer connected to a third. At all times the system security feature will ensure document integrity and confidentiality.

How the Computer Saves Time in Medical Searches and Fax Messages

Most physicians are aware of the vast resources available for searching for medical information by modem, a device that enables the computer to communicate with a remote computer site over telephone lines. Some modems can be connected to a computer externally while others are installed internally. The Honolulu Medical Library and the National Library of Medicine both offer services that allow literature searches from virtually any computer. Similar levels of support for information retrieval are offered by government and private agencies, and academic institutes throughout the world. Most of these agencies and institutes are accessible through the worldwide Internet system. Software for taking advantage of these services is quite easy to use and very helpful. In many cases enhanced, standard specification or public domain software is used by the service to greatly facilitate information search and retrieval requests. These enhancements are normally available on diskettes or by electronic downloads, either free or for a small fee.

Most current modems also support facsimile transmission

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protocols. A computer connected to such a modem now can act like a fax machine. Documents can be sent out from a variety of programs and incoming fax messages can be stored in files on the computer's disks. These functions can be performed in "background" mode, allowing the computer to be used normally with other applications. Once a facsimile is received, optical character recognition (OCR) software can be used to clean up the document and convert it into a standard word processor file. Once in this form, the document can be resent either as a file, by modem transfer or as a facsimile image.

Keeping Tax Records with the Computer

Anyone who does not use Quicken or a similar checking account program does not know what he or she missing. These programs offer much more than simply balancing the checkbook. After entering the checking information, a large number of reports can be generated, including all of the information needed for income tax filing. Accountants probably will have already recommended the use of these small, yet powerful application programs; they make it much easier to track office overhead expenses, profits and losses, and all forms of daily accounting data. They also provide an easy way to keep your eyes on the books.

Using Quicken to write checks ensures that the user always knows what transactions are being made in the accounts. Reconciliation becomes an almost automatic functional operation, making it easy to verify that the numbers match up. Detecting errors caused by the bank or by office staff can be done in a few minutes, instead of hours. An up-to-the-minute accounting also is possible. An alternative to Quicken is Microsoft Money, which offers similar functions and features. For more advanced accounting capabilities, full accounting packages similar to the PeachTree Accounting series are recommended.

A Generic Processing System Recommendation

Hardware—Windows-based systems running on 486-based computers currently are the most cost-efficient solutions. Powerful, fully configured systems can be purchased for under $2,000. The system should have at least 8 bytes of RAM (it will run much slower without this upgrade) and 200 MBytes of hard disk. It should include a fax-modem card and a backup device (tape drive, cartridge storage device, etc.). A CD-ROM drive is a nice addition that is becoming an essential system component; if not purchased with the system it can be added later. Macintosh microcomputers, Sun workstations, and other systems offer wonderful alternatives, but they tend to be more expensive. *Do not buy a computer with less than 8 Mbytes of ram, less than 200 Mbytes of hard drive, and a graphics accelerator card for the monitor. Do not buy a monitor with a pixel display greater than .28 mm pitch. Upgrades are inevitable because the resolution will be insufficient.*

To enhance a system further, consider investigating the capabilities and advantages offered by any of the following components and peripheral devices.

Optional Equipment:
- Scanner
- CD-ROM reader
- Laser printer
- Color printer
- Video capture board
- Multimedia cards
- Bar code scanner

Software—To properly support the plethora of application software available on the market today, reliable operating system software must be used. At present the most comfortable environment for 486-based machines is the combination of DOS 6.0 used with Windows 3.1. IBM's OS/2 software is very good and offers some advantages to the DOS/Windows option, but requires large amounts of disk space to properly support. (For the Macintosh, the System 7 operating system offers a wide range of capabilities in a comfortable user environment).

Currently all of the popular microcomputer operating systems offer some level of multi-tasking; the ability to perform more than one task at the same time. True multi-tasking, the ability to run multiple programs, not only will depend on the operating system, but also the design of the application programs. All Windows-based and OS/2-based software are designed for multi-tasking environments. Figure 2 illustrates a situation where 3 application programs are running concurrently. In addition, there are several utility programs running in the "background".

The following Table lists the major application categories and corresponding program recommendations. In addition, a secondary list offers viable alternative programs for each application category.

Alternatives—Each of these options represents a solid choice from among several excellent alternatives in its class. They are given as a basis for forming a good system, and to minimize complications during the set up period. All of these programs can exchange data with other popular competitive products. Other choices would work, and might even be preferable for some situations. For more information about these competitive products and their advantages and disadvantages, contact your local computer stores and refer to any of the several informative computer magazines now available.

Application Software–M.S. Windows 3.1 running on M.S. DOS 6.0 or higher.

Application Catagory	*Recommended Program*	*Alternative Program*
Basic Accounting	• Quicken	MS Money
Word processing	• MS Word	WordPerfect
Data base management	• MS Access	Paradox
Fax communications	• Winfax Pro	FaxGrabber
Networking	• MS Workgroup for Windows	Lantastic
Spreadsheet	• MS Excel	Quatro Pro

Total estimated system cost: approximately $3,000.

How to Do It

Buy the computer as fully configured as possible. It might cost a little more to get the exact system you want, but the amount of time and trouble it will save are well worth the extra money. Novices should buy from a local vendor and have the system set up and tested. Again, the slight additional cost will save hours of aggravation. (If you want to learn about computers in addition to using them, buy components through a local distributor or through the mail and try to set them up yourself.)

After setting up your computer (including windows), install Word, Access, Quicken and Winfax. This is easy to do. Simply insert the diskette labeled "Install" and follow the directions. It takes about 30 minutes to install these programs. Next, learn a little about how to use each of these programs. Each comes with a tutorial that takes an hour or so to do. Once you are familiar with the way the programs work, you can start to use them.

Start using Quicken to enter your checks immediately. If you like, you can get Quicken checks from your bank, which is often cheaper than buying them from other sources. This is particularly useful if you have an extra printer or if you do all of your checks in batches. Otherwise the time lost in changing the paper in the printer is greater than the time saved by having Quicken write the checks.

Start using Word to do simple correspondence and short reports. Experiment with Word's insertion capabilities to install simple diagrams, tables, and even equations into your documents. As you become more sophisticated, you will discover how easy it is to customize your documents to produce a personalized style and a professional appearance. Templates can be designed that can be used to facilitate the rapid distribution of personal and professional correspondences. A more advanced option is to pre-program functions (creating "macro programs") to automatically generate required documentation on request. Fantastic amounts of time can be saved by customizing these "macros" to your personal situation.

Set up Winfax to receive in background for your faxes. This will save money and time on fax paper, space, and machine costs. Facsimile transmissions then can be initiated from the Winfax environment or from the Word environment after the document has been created.

Start to use Access to initiate the filing of medical claims; it also can be used for patient registration. This will provide the generation of an electronic mailing list of patients. If the data is entered at the time of registration, it will be there for use when each claim form is filled out. Designing the data base is a bit tricky and may require some assistance from an experienced data base expert or consultant. [Call or write for information to obtain a free copy of a soon-to-be-available medical data base.] Access is fantastically flexible and can easily be customized to the individual needs of any office. It is also an incredible deal: Originally projected to cost $795, it is currently available for $89 because of competition with Paradox (Borland International), another excellent program. We favor Access at this time because of its tighter integration with Windows.

Conclusion

With a new generation of inexpensive, but powerful processors and user-friendly software, every medical office now has the opportunity to reap the benefits of the information age. Whether to reduce the administrative and bureaucratic workload or to enhance actual medical applications and procedures, computer support in the office is rapidly evolving from a luxury to a necessity. By utilizing off-the-shelf hardware and software, and with a little creative imagination, tremendous improvements in office efficiency and overall business operations are obtainable. This discussion has only scratched the surface of what capabilities are possible. In most cases, only the user's imagination sets the limits for office automation. ■